

Application No. 09/767,463
Response to April 7, 2004 Office Action
Docket No. 7227-253

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-8 – previously cancelled.

9. (Currently Amended) A method of manufacturing a transmission line coupler comprising the steps of:

manufacturing a plurality of substrate layers, said plurality comprising at least three substrate layers;

etching at least five metal layers, comprising a first metal layer, a second metal layer, a third metal layer, a fourth metal layer, and a fifth metal layer, disposed on at least a subset of said plurality of substrate layers, wherein said second metal layer is part of a segment of said transmission line coupler and is between said first metal layer and said third metal layer, said third metal layer is between said second metal layer and said fourth metal layer, and said fourth metal layer is part of another segment of said transmission line coupler and is between said third metal layer and said fifth metal layer;

subsequent to the etching of the metal layers, simultaneously fusion bonding the plurality of substrate layers to each other;

through said fusion bonding, connecting said third metal layer to said first metal layer and said fifth metal layer to form groundplanes such that the first metal layer forms a first groundplane, the third metal layer forms a second groundplane, and the fifth metal layer forms a third groundplane; and

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through said fusion bonding, connecting the coupler segment disposed on said second metal layer to the coupler segment disposed on said fourth metal layer by a transmission line structure to form said coupler.

10. (original) The method of manufacturing a coupler of claim 9, wherein said plurality of substrate layers comprise a polytetrafluoroethylene composite.
11. (original) The method of manufacturing a coupler of claim 9, wherein via holes are used to connect at least two of said at least five metal layers.
12. (original) The method of manufacturing a coupler of claim 9, wherein slabline transmission lines are used to connect at least two of said at least five metal layers.
13. (Previously Amended) The method of manufacturing a coupler of claim 9, wherein said transmission line coupler has a frequency of operation between approximately 0.5 GHz and approximately 6.0 GHz.
14. (Previously Amended) The method of manufacturing a coupler of claim 9, wherein said transmission line coupler is a wideband coupler.
15. (original) The method of manufacturing a coupler of claim 14, wherein said wideband coupler is a non-uniform coupled structure.
16. (original) The method of manufacturing a coupler of claim 14, wherein said wideband coupler is a Cappucci coupler.

Claims 17-24 - previously cancelled.

25. (Previously Added) The method of claim 9 wherein:
connecting said third metal layer to said first metal layer and said fifth metal layer comprises
connecting by a plurality of transmission line structures; and

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connecting the coupler segment disposed on said second metal layer to the coupler segment disposed on said fourth metal layer comprises connecting by a transmission line structure.

26. (New) A method of manufacturing a transmission line coupler comprising the steps of:

manufacturing a plurality of substrate layers, said plurality comprising at least three substrate layers;

drilling via holes through at least a subset of the plurality of substrate layers;

plating the substrate layers with a conductive metal to form at least five metal layers and to form conductive connections through said via holes between top and bottom surfaces of said drilled substrate layers;

etching the at least five metal layers, said metal layers comprising a first metal layer, a second metal layer, a third metal layer, a fourth metal layer, and a fifth metal layer wherein said second metal layer is part of a segment of said transmission line coupler and is between said first metal layer and said third metal layer, said third metal layer is between said second metal layer and said fourth metal layer, and said fourth metal layer is part of another segment of said transmission line coupler and is between said third metal layer and said fifth metal layer;

subsequent to the etching of the metal layers, simultaneously fusion bonding the plurality of substrate layers to each other;

through said fusion bonding, connecting said third metal layer to said first metal layer and said fifth metal layer to form groundplanes such that the first metal layer forms a first groundplane, the third metal layer forms a second groundplane, and the fifth metal layer forms a third groundplane; and

through said fusion bonding, connecting the coupler segment disposed on said second metal layer to the coupler segment disposed on said fourth metal layer by a transmission line

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structure to form said coupler.

27. (New) The method of manufacturing a coupler of claim 26, wherein said plurality of substrate layers comprise a polytetrafluoroethylene composite.

28. (New) The method of manufacturing a coupler of claim 26, wherein via holes are used to connect at least two of said at least five metal layers.

29. (New) The method of manufacturing a coupler of claim 26, wherein slabline transmission lines are used to connect at least two of said at least five metal layers.

30. (New) The method of manufacturing a coupler of claim 26, wherein said transmission line coupler has a frequency of operation between approximately 0.5 GHz and approximately 6.0 GHz.

31. (New) The method of manufacturing a coupler of claim 26, wherein said transmission line coupler is a wideband coupler.

32. (New) The method of manufacturing a coupler of claim 31, wherein said wideband coupler is a non-uniform coupled structure.

33. (New) The method of manufacturing a coupler of claim 131, wherein said wideband coupler is a Cappucci coupler.

34. (New) The method of claim 26 wherein:

connecting said third metal layer to said first metal layer and said fifth metal layer comprises connecting by a plurality of transmission line structures; and

connecting the coupler segment disposed on said second metal layer to the coupler segment disposed on said fourth metal layer comprises connecting by a transmission line structure.